



Climate change, agriculture and food security challenges

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LIVESTOCK, FISHERIES, AND ADAPTATION GAPS

Focusing on livestock and poultry, heat stress causes a range of physiological and behavioural changes, including reduced feed intake, nutrient absorption, and feed conversion efficiency, lower feed availability, and diminished reproductive capacity. These effects lead to declines in milk and meat production, lower productivity in poultry and cattle, reduced wool output in sheep, and poor growth and weight loss in cattle and sheep. Public knowledge of the extent to which climate change affects livestock and poultry output in Bangladesh remains extremely limited; however, without ameliorative measures, adverse impacts are inevitable.

The other major sub-sector of agriculture which is expected to be adversely affected due to climate change impact is fisheries both inland (open capture, aquaculture) and marine fisheries. Recent information indicates that of the total output of 50 lakhs mt of fish, 30 lakh mt or 60 per cent was from aquaculture in closed water bodies, while over 14 lakhs mt or nearly 30 per cent was from open water bodies like rivers and estuaries and very extensive flood plain. Marine fisheries account for the rest mainly from territorial water, exclusive economic zone and continental shelf.

Even without climate change, fish habitats particularly inland open waters and marine systems are already under significant stress. Overfishing, degraded water

quality from industrial effluents, infrastructure development across water bodies, and elite capture of fishing grounds have long contributed to this pressure. Climate change both intensifies and adds to these stressors, with rising water temperature as the common and most critical factor. Higher temperatures are likely to alter species composition as fish migrate to cooler depths or areas, especially in open capture

are known to have occurred in the ocean water which are rising temperature of sea water, acidification and deoxygenation. All are known to adversely impact on fish stock, changes in species and in cases outright extinction. For example, in case of the Bay of Bengal adjacent to Bangladesh coast, it has been found that while in 1971 there were reports of 475 fin fish species; this fell to 185 for fin fish and shellfish by 1993; to 98

the case at the moment.

ADAPTATION GAPS AND THE WAY FORWARD

The above discussion indicates that food and nutrition security as a whole is under extreme threat in both near and long-term future under climate change and its multifarious impacts. Question is how far we are aware of these problems and what have we done so far? As required by the United Nations Framework Convention on Climate Change (UNFCCC) of which Bangladesh is a Party, the country has prepared and submitted in 2022 its latest National Adaptation Plan (NAP: 2023-2050) covering various sectors including agriculture vulnerable to climate change and its impacts.

While this is not the place for detailed discussion on the strategy and programmes for adaptation, one good point about the NAP is its focus on water resources issues which as we have stated earlier is the key to managing many of the problems arising out of climate change including those in agriculture. Given this, however, one looks almost in vain, for clear and specific ideas about adaptation in crop, livestock and fisheries. The reasons are not far to seek as the NAP itself calls for specific data and information on the vulnerabilities that these sub-sectors face. Whatever adaptation measures have been proposed needs to be firmed up now through a clear roadmap for implementation and revising the proposals, if necessary to achieve the goals. The sooner this is done is better.

SNAPSHOT

Climate change threatens Bangladesh's food and nutrition security through rising temperatures and erratic rainfall.

1. Water availability and biodiversity loss are central channels through which climate impacts agriculture.
2. Rice production, especially boro and aman, faces rising risks from droughts, floods, salinity, and heat stress.
3. Livestock and fisheries are increasingly vulnerable to temperature rise, disease, and ecosystem degradation.
4. Existing adaptation plans lack clear, sector-specific pathways for crops, livestock, and fisheries.

and marine fisheries, while others may fail to survive or face eventual extinction. In aquaculture, farmers may need to adopt heat-tolerant breeds. Across all systems, warmer waters also increase the likelihood of water-borne parasites and viruses, degrading fish health and potentially compromising food safety.

In case of marine fisheries, several types of observed changes

for finfish along Naf river estuaries, and just 53 finfish by 2013 (in Ganges Meghna estuaries).

Overall fish output from all types of fisheries, is likely to decline over time unless appropriate adaptation measures are undertaken. However, for marine fisheries such adaptation at national scale is not possible unless vigorous global mitigation efforts are underway which is not

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